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THE LEGISLATURE • STATE OF MICHIGAN

Legislative Service Bureau



125 W. Allegan, Third Floor

Lansing, Michigan 48913

Telephone (517) 373-0170

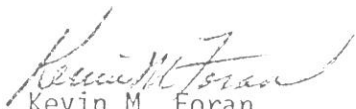
August 10, 1981

Office of the Attorney General  
Law Building, 7th Floor  
Lansing, Michigan

Gentlemen:

We have today approved as to form, classification, arrangement, and numbering proposed rules of the Department of State Police entitled "Motorcycle Protective Headgear," dated July 24 1981, and enclose nine copies of the rules, to eight of which our certificate of approval is attached.

Very truly yours,

  
Kevin M. Foran  
Legal Counsel

KMF/k

Enclosures

/cc: F/Lieutenant LeRoy A. Fladseth, Traffic Services Division,  
Department of State Police

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CERTIFICATE OF APPROVAL

I hereby certify that the Legislative Service Bureau has examined the attached rules of the Department of State Police entitled "Motorcycle Protective Headgear," dated July 24, 1981, and further certify that, pursuant to section 45 of Act No. 306 of the Public Acts of 1969, as amended, being 524.245 of the Michigan Compiled Laws the Legislative Service Bureau approves the rules as to form, classification, arrangement, and numbering

Dated August 10, 1981

LEGISLATIVE SERVICE BUREAU

By

A handwritten signature in ink, appearing to be "Carolyn Kilpatrick", written over a horizontal line.

Director

STATE OF MICHIGAN

DEPARTMENT OF ATTORNEY GENERAL

TO: Department of State Police


I hereby certify that I have examined the attached rules of the Department of State Police, entitled "Motorcycle Protective Headgear," dated July 24, 1981, which have been approved as to form by the Legislative Service Bureau, as indicated by the certification attached thereto.

The foregoing rules are hereby approved by me as to legality pursuant to the requirements of the provisions of 1969 PA 306, as amended, MCLA 24.201 et seq; MSA 3.560 (101) et seq

In certifying these rules as to legality, I have determined that they are within the scope of authority of the agency, that they do not violate any constitutional rights such as the denial of due process or equal protection and that they are in conformity with the requirements of the Administrative Procedures Act.

You are further advised that, upon receipt of this certification, you are required by 1363 PA 306, supra §45(2) to obtain a certificate from the Joint Committee on Administrative Rules so that the committee may determine whether the rules conform to the legislative intent and, in other respects, are wise and expedient.

FRANK J. KELLEY  
Attorney General

  
William E. Molner  
Assistant Attorney General

Dated: August 19, 1981

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THE LEGISLATURE  
LANSING, MICHIGAN



JOINT COMMITTEE ON ADMINISTRATIVE RULES

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CERTIFICATE OF APPROVAL

DATE: October 27, 1981

SUBJECT: Trans. No. 81-107

I hereby certify that the Joint Committee on Administrative Rules approved the administrative rules from the Department of State Police, Traffic Services Division, Pertaining to Motorcycle Protective Headgear, dated July 24, 1981.

Sincerely,

A handwritten signature in ink, appearing to read "Doug Ross".

DOUG ROSS  
Chairman

DR:cak



November 16, 1981

NOV 17 1981

ADMINISTRATIVE RULES  
NOTICE OF FILING

TO: Secretary of the Senate  
Clerk of the House of Representatives  
Joint Committee on Administrative Rules  
Legislative Service Bureau (Item 19, supplement 8)

In accordance with the provisions of Act 306, Public Acts of 1969, as amended, this is to advise you that administrative rules have been filed by the Department of State Police Traffic Services Division pertaining to Motorcycle Protective Headgear.

These rules, which take effect 15 days after filing with this office, were filed November 16, 1981, at 10:00 a.m.

Very truly yours,

RICHARD H. AUSTIN  
SECRETARY OF STATE

Gay Meese, Supervisor  
Great Seal & Registration Unit

Attachments

cc: Angie Joseph  
Filing Agency

DEPARTMENT OF STATE POLICE

TRAFFIC SERVICES DIVISION

MOTORCYCLE PROTECTIVE HEADGEAR

FILED  
RICHARD H. AUSTIN, SEC. OF STATE  
STATE OF MICHIGAN

NOV 16 1981

AM PM  
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Filed with the Secretary of State on  
These rules take effect 15 days after filing with the Secretary of State

(By authority conferred on the department of state police by section 658 of Act No. 300 of the Public Acts of 1949, as amended, being 257.658 of the Michigan Compiled Laws)

R 28.951 Definitions.

Rule 1. As used in these rules:

(a) "Basic plane" means a plane that is laid out on a specific reference headform derived from the anatomic basic plane of Reid's baseline. It is the plane at the level of the external opening of the ear and the floor of the bony rim of the eye socket.

(b) "Mid-sagittal plane" means a longitudinal, or fore and aft, plane passing through the vertex of the headform, perpendicular to the basic plane, which geometrically bisects the headform.

(c) "Projection" means any part that extends beyond the protective headgear surface in an abrupt fashion.

(d) "Protective headgear" or "crash helmet" means a device which is worn on the head and which is designed to mitigate the adverse effects of a blow to the head as specified in these rules.

(e) "Reference plane" means a plane which is measured 2.36 inches (60 millimeters)  $\pm 0.04$  of an inch (1 millimeter) above the parallel to the basic plane as defined in these rules.

(f) "Retention system" or "harness assembly" means the completed assembly which maintains the protective headgear in position on the wearer's head

(g) "Standard test headform" means a contoured test device considered suitable for properly testing protective headgear that would fit approximately 95% of the population of all races. The headform shall be marked indicating the basic, mid-sagittal, and reference planes.

R 28.952 Construction.

Rule 2. (1) A protective headgear shall consist of a hard and smooth outer surface which contains the necessary means of attenuating impact energy and resisting penetration. Optional devices fitted to the protective headgear shall be designed so that they are unlikely to cause injury to the wearer in the event of an accident.

(2) The assembled protective headgear shall not have any permanent external projections of more than  $3/16$  of an inch (5 millimeters) in height

(3) The retention system shall be constructed so that when it is properly fastened the protective headgear cannot be readily dislodged from its normal position on the wearer's head during impact conditions,

(4) The protective headgear shall provide a minimum peripheral visual clearance of  $12\frac{1}{2}$  degree: to each side of the mid-sagittal plane. This angle shall be measured on the standard headform in the basic plane with its apex at the anterior surface of the headform where the mid-sagittal and basic planes intersect.

July 24, 1981

(5) Materials used in the manufacturing of protective headgear shall be of a durable quality and shall not be altered appreciably over time in normal use by their exposure to sun, rain, temperature variations, dust, vibrations, or contact with body tissues or fluids or the products used on the skin and hair.

R 28.953 Labeling.

Rule 3. Each protective headgear that is offered for sale shall have a durable label which identifies the model designation and the manufacturer. The label shall include both of the following statements:

(a) "A protective headgear cannot protect the wearer against all foreseeable impacts. However, for maximum protection the helmet must fit well and all retention straps must be securely fastened."

(b) "This protective headgear is constructed so that the energy of a severe blow is absorbed through partial destruction of the headgear, though damage may not be visible to the naked eye. If the headgear suffers such an impact, it should either be returned to the manufacturer for competent inspection or destroyed and replaced."

R 28.954 Extent of protection.

Rule 4. (1) The extent of the protection provided by the protective headgear shall include all areas above the reference plane. The protective components of the headgear shall not be inadvertently detachable, nor shall they detach under test impact.

(2) The entire area of the protective headgear above the reference plane, except for an area located 1 inch above the reference plane and extending 120 degrees plus 1 inch on either side of the apex point, as measured in a top view of a headform, shall attenuate impact to not less than the minimum requirements specified in R 28.957.

R 28.955 Testing; headgear condition and attachments.

Rule 5. (1) All protective headgear shall be tested in the same condition in which it is offered for sale and shall be accompanied by all attachments, other than eye protection devices, which are normally sold with the protective headgear. Such attachments shall not be installed on the helmet during testing.

(2) Four sample crash helmets are required for testing. Following exposure to its respective environmental condition as described in R 28.956, each test crash helmet shall be subjected to all tests and visual observations set forth in these rules.

R 28.956 Preconditioning of protective headgear for testing.

Rule 6. (1) The first protective headgear shall be tested at ambient conditions as defined in R 28.960.

(2) The second protective headgear shall be conditioned before testing by being exposed in a controlled environmental temperature apparatus to a temperature of - 10 degrees Centigrade (14 degrees Fahrenheit) + 2 degrees Centigrade (3.6 degrees Fahrenheit) for not less than 4 nor more than 24 hours.

(3) A third protective headgear shall be conditioned before testing by being exposed in a circulating air oven to an air temperature of 50 degrees Centigrade (122 degrees Fahrenheit) +2 degrees Centigrade (3.6 degrees Fahrenheit) for a period of not less than 4 nor more than 24 hours.

(4) Before testing a fourth protective headgear shall be immersed in water at a temperature of 25 degrees Centigrade (77 degrees Fahrenheit) to 5 degrees Centigrade (9 degrees Fahrenheit) for a period of not less than 4 nor more than 24 hours.

R 28.957 Tests for protective headgear.

Rule 7. (1) The impact attenuation, penetration, and retention system tests set forth in this rule and R 28.958 and R 28.959 shall be conducted in the order in which they appear.

(2) Testing shall begin immediately after the protective headgear is removed from the continuing equipment. For actual testing, the maximum time during which the protective headgear may be out of the conditioning environment shall not be more than 5 minutes before again being withdrawn. This process shall be continued until a specific item of protective headgear has been put through all necessary testing.

(3) Impact attenuation shall be measured by determining the imparted acceleration to an approximately instrumented standard test headform dropped in a guided fall, vertical within 1/2 inch (13 millimeters) per 15 feet (4.57 meters) of height, upon a fixed rigid steel anvil base.

(4) With any of the 4 preconditioned protective headgear a peak acceleration of the test headform that is more than 300 times the force of gravity shall be cause for failure. Acceleration shall be measured with an instrumentation system whose accuracy, including reading error, shall be at maximum ~~4~~ 28 times the force of gravity. Readings shall not be corrected for Instrumentation accuracy.

(5) The time duration of the recorded accelerations at the 200 times the force of gravity and 150 times the force of gravity levels shall be measured and reported for information only.

(6) Accelerations in excess of 150 times the force of gravity shall be cause for failure of the protective headgear if the duration of acceleration at the 150 times the force of gravity level is more than 6 milliseconds with instrumentation measuring the duration.

(7) Each protective headgear shall be impacted with 2 successive identical impacts on not less than 4 sites. The centers of each pair of impacts shall be located not more than 1/4 inch (6 millimeters) apart. Two of these impacts shall be upon a flat steel anvil and 2 shall be upon a hemispherical steel anvil. The impact sites shall be above the reference plane and shall be separated from each other by a distance of not less than 1/6 of the maximum circumference of the protective headgear. The flat steel anvil shall have a 5-inch (127 millimeter) minimum diameter and the hemispherical steel anvil shall have a 1.9-inch (4.8 millimeter) radius. The steel anvil shall be backed up with a solid mass weighing not less than 300 pounds and shall be faced with a steel plate of 1-inch (25.4 millimeter) minimum thickness and 1-foot squared (0.1 meter squared) minimum surface area.

(8) The impact velocities for both the flat and hemispherical anvil's shall be measured for each test impact and shall be within a tolerance of 0% to 5% in both of the following tests:

(a) First blow: 22.7 feet per second (6.9 meters per second).

(b) Second blow: 19.7 feet per second (6.0 meters per second).

(9) The test headform shall be constructed of low resonance magnesium alloy and shall weigh 11 ± 0.2, - 0 pounds (5 ± 0.091, - 0 kilograms). The weight shall include the supporting arm. Minor dents or anomalies or both, that are introduced into the headform may yield erroneous test results

(10) The protective headgear shall be placed on the test headform so that the reference plane on the headgear is coincident with the reference plane on the test headform before each drop. The protective headgear shall be secured to the headform and crossarm by its retention system to maintain this position during free-fall.

R 28.958 penetration test.

Rule 8. (1) The complete protective headgear shall be placed on a rigidly mounted standard headform whose surface shall be electrically conductive. If the protective headgear contains a sling or other adjustable-sizing component, it shall be relaxed to its most extendable position.

(2) The penetration test shall be conducted by dropping the penetration test striker onto the outer surface of the protective headgear anywhere above the reference plane in a direction essentially perpendicular to the outer surface of the protective headgear. The tip of the striker shall be electrically conductive.

(3) There shall be not less than 2 penetration blows applied to each of the preconditioned protective headgear. Such blows shall be not less than 3 inches (76 millimeters) apart and shall be located not less than 3 inches (76 millimeters) from the center of any impact points.

(4) When tested pursuant to subrule (2) of this rule, the protective headform shall be failed if demonstrable electrical contact is made between the striker and the conducting surface of the headform.

(5) The specifications for the penetration tests are as follows:

(a) The weight of the penetration test striker shall be 6 pounds, 10 ounces  $\pm 0.1$ , - 0 pounds (3.0 kilograms  $\pm 45$ , - 0 grams).

(b) The point of the striker shall have an included angle of 60 degrees  $\pm 0.5$  of a degree and a cone altitude height of not less than 1.5 inches (38 millimeters).

(c) The radius of the striking point shall be 0.0197 of an inch  $\pm 0.004$  of an inch (0.5 millimeter  $\pm 0.1$  millimeter)

(d) The hardness of the striking tip shall be a minimum of 60 Rockwell (Scale C). S.A.E. standard J 417b, on the Rockwell scale may be purchased for \$2.00 from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

(e) The height of the fall shall be 118.11 inches  $\pm 0.6$  of an inch (3 meters  $\pm 15$  millimeters), as measured from the striker point to the outer surface of the mounted protective headgear.

R 28.959 Test of tensile strength of retaining system.

Rule 9. (1) The protective headgear shall be placed on a test headform with the chin strap fastened over a device approximating the shape of the bony structure of the lower jaw. This device shall consist of 2 metal rollers, each  $\frac{1}{2}$  inch  $\pm 0.004$  of an inch (12.7 millimeters  $\pm 0.1$  millimeter) in diameter, at a distance of 3 inches  $\pm 0.04$  of an inch (76.2 millimeters  $\pm 1$  millimeter) separation on center, which would serve to represent the jawbone. The protective headgear shall be supported on the headform so that the points of attachment of the chin strap to the headgear are subject to the same test as the strap itself.

(2) The retaining system shall be tested for ultimate strength and for elongation under tension as follows: After applying a 50-pound preload  $\pm 1$  pound (23 kilograms  $\pm 0.5$  kilograms) for not less than 30 seconds, an additional 250-pound  $\pm 5$  pounds (113.6 kilograms  $\pm 2.2$  kilograms) weight, or tension equivalent, shall be applied to the device retained by the chin strap for not less than 2 minutes. Any parting of the strap or its attachments or any elongation of more than 1 inch (25.4 millimeters) in the vertical distance of the chin strap from the helmet crown as measured between preload and 300-pound (136 kilogram) load, shall result in failure of the test. The retaining system shall be loaded to the point of failure.

R 28.960 Preparation of test equipment.

Rule 10. (1) Before testing, all equipment shall be turned on and allowed to warm up for not less than 30 minutes or until equilibrium is reached, whichever time is greater.

(2) The following environmental conditions shall prevail throughout the period of calibration and testing:

(a) Temperature: 70-85 degrees Fahrenheit (22-30 degrees Centigrade).

(b) Relative humidity: 30-70%

(3) The entire instrumentation system shall be checked before and after each series of tests by impacting a standardized calibrating medium capable of producing an acceleration-time history of 400 times the force of gravity and a time duration of at least 1 millisecond duration at 200 times the force of gravity. Not less than 3 such impacts shall be recorded before and after testing and shall be made part of the test report. If the acceleration-time history is out of predetermined tolerance before the test, the system shall be adjusted or repaired as necessary. If the post-test average of the 3 impacts differs from the pre-test average by more than 40 times the force of gravity, the entire test series shall be discarded.

(4) A record shall be made of each test impact and shall be retained as a permanent record of the acceleration-time history.

R 28.961 Test equipment.

Rule 11. (1) Standard headforms shall be used in testing and measurement. The center of gravity of the headform, including the crossarm shall lie within a cone with the axis vertical and forming a 10-degree included angle with the apex at the point of impact. The combined weight of the crossarm and headform shall be  $11 \pm 0.2$ , - 0 pounds (5 to 0.091 - 0 kilograms)

(2) The acceleration transducer shall be mounted with the sensitive axis aligned to within 5 degrees of true vertical when the headform is in the impact position. The acceleration transducers shall have a natural frequency of 20,609 Hertz or more and shall be capable of withstanding a shock of 2000 times the force of gravity without damage.

(3) Medium and large size protective headgear shall be tested on the standard headform size. Small size headgear of the same type shall be approved if visual inspection shows the construction to be essentially identical to those tested.

(4) A controlled, mechanically cooled temperature box of not less than 2 x 2 by 2 feet (0.6 by 0.6 by 0.6 meters) inside dimensions shall be available with controlled temperature capability of - 10 degrees Centigrade (14 degrees Fahrenheit) ~~+ 2~~ degrees Centigrade (3.6 degrees Fahrenheit). It shall hold the prescribed temperature for a minimum of 24 hours.

(5) A controlled temperature box of not less than 2 by 2 by 2 feet (0.6 by 0.6 by 0.6 meters) inside dimensions shall be available with a controlled temperature capability of 50 degrees Centigrade (122 degrees Fahrenheit) + 2 degrees Centigrade (3.6 degrees Fahrenheit). It shall hold the prescribed temperature for a minimum of 24 hours.

(6) The recording system shall match the frequency response of the accelerometer, and the entire recording system shall be flat 1 decibel over a minimum frequency band of 5 to 3000 Hertz. ~~+/-~~

(7) The standard reference headform, on which the basic plane is marked, shall be positioned on a flat surface so that the basic plane is parallel to this surface. The reference plane shall be scribed on the helmet after it has been positioned on the reference headform so that the lower-most part of

the leading edge at the front of the helmet is 2.36 inches (60 millimeters) above the basic plane.

(8) The velocity sensing system shall include an appropriate transducer which shall produce a discrete output resolvable within 200 microseconds.